

## Conference Abstract

# Development of a National Repository for Aquatic Biodiversity in Bhutan

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## Abstract

In response to a request from the Royal Government of Bhutan, the World Bank commissioned a study on the sustainable development of hydropower in Bhutan. The study identified loss and decline of aquatic biodiversity as one of the major potential environmental impacts of hydropower development in Bhutan.

Access to information on aquatic biodiversity is of utmost importance in planning and designing of new hydropower projects in Bhutan. This data is essential for planners to avoid, minimize and effectively mitigate potential adverse impacts on aquatic biodiversity. However, access to this information is not easy. With the objective of making aquatic biodiversity data accessible, key stakeholders within Bhutan have taken the initiative to create and maintain a national data repository for aquatic biodiversity within the country. An inventory and gap analysis of aquatic biodiversity data in Bhutan was done to summarize the available data and information on aquatic biodiversity, stakeholder meetings were held to obtain feedback for the repository and a plan of action has been formulated for creating the repository.

Bhutan already maintains a rich biodiversity information repository - the Bhutan Biodiversity Portal (BBP, <http://biodiversity.bt/>), under the aegis of the National Biodiversity Centre



(NBC), Ministry of Agriculture and Forests, Serbithang, Thimphu. The platform is powered by the open source Biodiversity Informatics Platform that also powers the India Biodiversity Portal (IBP) and a portal on Weed Identification and Knowledge in the Western Indian Ocean (WIKWIO). Additional data fields and functionality were identified to extend the functionality of BBP to cover the needs of the stakeholders. Primarily, interfaces will be built to upload already available datasets on organisms that have been surveyed and identified, as well as newer aquatic biodiversity data that will be generated by surveys and monitoring in future. The portal will facilitate upload of data that captures observed characteristics, e.g., life stage, body size, reproductive state; environmental variables of the locality of occurrence; and other sampling data such as sampling gear and mode of observation. It will also enhance species knowledge by adding the ability to link existing species pages with international databases such as IUCN and FishBase, as well as fields to store voucher specimen details and ecological status. All tabular data that is added will be synchronised to either standard observation fields, custom observation fields that are relevant to aquatic biodiversity or to species traits. Data that cannot be categorised under any of the above will be stored as key value pairs. The data upload module will have metadata marked up to the Ecological Metadata Language (EML) metadata specification and data will be available for exchange using the Darwin Core (DwC) standards.

The platform will be enabled with an enhanced search and serve function through easy-to-use query panels. Uploaded data will be aggregated and visualised on the portal along spatial, temporal and taxonomic axes. Furthermore, it will be available for stakeholders to download under Creative Commons licences for further processing and planning. The creation of the repository will be complemented by training the stakeholders in data curation and developing a campaign to build awareness of the portal within the community of stakeholders.

The establishment of this repository will provide a guide to conserve aquatic biodiversity, maintain ecosystem functioning, and protect livelihoods and food security dependent upon aquatic biodiversity. It will also contribute to the open source biodiversity informatics platform and be available to all other instances of the portal. This will help in enriching the functions of the open source platform and provide value to conservation of biodiversity in other areas of the world.

## **Keywords**

Aquatic biodiversity, Tabular data, Species traits, Hydropower

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